MORE ICHTHYOLOGICAL MISCELLANEA.

By Gilbert P. Whitley, Ichthyologist, The Australian Museum, Sydney.*

(Plate IV, and Text-figures 1-6.)

The present paper may be regarded as a continuation of the "Ichthyological Miscellanea" which appeared over five years ago in these Memoirs (vol. x, pt. 1, 1930, p. 8). In that contribution a review of the work on Queensland ichthyology enabled those interested to maintain up to date the list of Queensland fishes published in 1925 (These Memoirs viii, p. 125). Nowadays, one is confronted by so many additions and alterations that the time is ripe for a revised list.

In the past decade an increasing number of collecting parties have visited the Great Barrier Reef, including the British expedition of 1928-29, a report on whose Fishes appeared in 1932. The present writer has been associated with several of these parties and has examined many hundreds of freshly caught and therefore correctly localized specimens. In this period he has collected at North-West Islet (1925), Michaelmas Cay (1926), Low Isles (1929), North-West Islet again (1931), and Lindeman Island to Bowen (1935), besides securing, during his holidays, specimens for comparison from Rarotonga (1931), Western Australia (1933) and various islands of the Pacific during recent cruises. He has been greatly assisted by his friend, Mr. Melbourne Ward, who made large fish collections at Heron Island (1926), the Bunker Group (1927), Torres Strait (1928), Hayman Id. (1928), Port Curtis and the Capricorns (1929, three trips), North-West Islet (1930), Papua (1933), and Lindeman Island, where he secured about 400 specimens during his term, just concluded, as Resident Naturalist, and where we together secured over one thousand specimens of elasmobranchs and fishes last year. Mr. F. A. McNeill, of the Australian Museum, has made several trips to the Cumberland Group and secured some remarkable species. Messrs. Hale and Tindale, of Adelaide, made a collection of fishes in Princess Charlotte Bay which was reported upon in Records of the South Australian Museum, v, 3, 1935, p. 345. A further British Expedition is promised at no distant date. All this field work has resulted in additional knowledge of the distribution and relative abundance of many Queensland fishes.

Turning to publications, apart from those already referred to, it is to be noted that Dr. N. A. Borodin, in the Bulletin of the Vanderbilt Museum, i, 1932, p. 69, lists a number of Queensland fishes collected by Mr. W. K. Vanderbilt on his world-cruise in the *Alva* during 1931-32. Mr. Fraser-Brunner

* Contribution from The Australian Museum.

(Ann. Mag. Nat. Hist. (10) xiii, 1934, p. 465) described a new snake eel from Queensland, and Mr. J. R. Norman (Proc. Zool. Soc. Lond. 1935, p. 99) mentions several of our Lizard-fishes. Papers dealing with taxonomy and nomenclature have appeared in these Memoirs, in the Australian Zoologist, and the Records of the Australian Museum, in recent years. The North Queensland Naturalists' Club, with headquarters at Cairns, now issues a small publication, in which fishes have been recorded. Cases of sharks attacking man in Queensland have been detailed by Dr. V. Coppleson in the Medical Journal of Australia for April 15, 1933.

Further welcome contributions to our knowledge of the Queensland Lungfish have been made by Longman, Bancroft, and Rudel in the Memoirs of the Queensland Museum and the Proc. Linn. Soc. N. S. Wales, whilst our smaller freshwater fishes are receiving more attention from aquarists, who are critically differentiating the various species. A preliminary account of the Devil Ray (*Daemomanta alfredi*) has appeared in The Australian Museum Magazine, vi, 1936, p. 4.

The works on Indo-Pacific fishes by Fowler, Giltay, Weber and Beaufort, Herre, and others, issued in recent years, are of importance to the study of our tropical species.

Once again it is my pleasing duty to thank the Queensland Museum officials for facilities for study granted to me on my visits to Brisbane. Mr. T. C. Marshall has identified a number of interesting species and has unreservedly placed his notes at my disposal. Amongst others, he has listed :

I. 5153 *Trygonorrhina fasciata* M. & H. [New rec. Qld.] Off Cape Moreton, S. Qld. (W. R. Howard).

I. 5205 *Anyperodon leucogrammicus* C. & V. Rib Reef, Townsville (G. Coates). [New record for Australia].

I. 5212 *Cephalopholis urodelus* C. & V. Flat Rock, S. Qld. (W. R. Howard). [New rec. Austr.]

I. 5257 *Epinephelus areolatus* Gmelin. Rib Reef, Townsville, Nth. Queensland (G. Coates). [New rec. for Australia].

I. 5291 *Epinephelus summana* Bonn. Cairns (N. Qld. Nat. Club).

I. 5259 *Epinephelus cyanostigma* C. & V. Rib Reef, Townsville, Nth. Queensland (G. Coates). [New rec. Australia].

I. 5293 *Sparus berda* Gmelin. Cairns (N. Qld. Nat. Club).

I. 5178 *Scolopsis bimaculatus* Ruppell. [New rec. Qld.] Cairns.

I. 5297 *Chætodon rainfordi* McCulloch. Noosa Beach (R. A. Cresdee).

Family CLUPEIDAE.

Sub-Family HYPERLOPHINAE.

Genus **HYPERLOPHUS** Ogilby, 1892.

HYALOSPRATTUS, subg. nov.

Orthotype, *Hyperlophus translucidus* McCulloch.

Differs from true *Hyperlophus* in the advanced situation of the anal fin, with corresponding skeletal modifications, and in coloration.

HYPERLOPHUS (HYALOSPRATTUS) TRANSLUCIDUS McCulloch.

Hyperlophus translucidus McCulloch, Rec. Austr. Mus. xi, 7, Feb. 20, 1917, p. 165, pl. xxix, fig. 3. Sans Souci, Botany Bay, New South Wales. Holotype and paratypes in Austr. Mus. *Id.* McCulloch, Austr. Zool. ii, 1921, p. 16 and Austr. Mus. Mem. v, 1929, p. 40.

Mr. H. S. Mort collected a specimen, 38 mm. in standard length, belonging to this species, when gathering shells on Caloundra Beach, south Queensland, early in June, 1935. Previously it had only been known from the Sydney district, New South Wales.

New record for Queensland. Austr. Mus. regd. no. IA. 6451.

Family SYNGNATHIDAE.

Genus **SOLEGNATHUS** Swainson, 1839.

SOLEGNATHUS FASCIATUS (Gunther).

Solenognathus fasciatus Gunther, Rept. Voy. Challenger, Zool. i, 6, 1880, p. 30, pl. xiv, fig. B. Off Twofold Bay, N. S. Wales. Type in British Museum. *Id.* Waite, Proc. Linn. Soc. N. S. Wales (2) ix, 1894, p. 227, pl. xvii, figs. 6 & 9.

Solegnathus fasciatus Waite, Mem. Nat. Club N. S. Wales ii. 1904, p. 19. *Id.* McCulloch, Zool. Res. Endeav. i, 1911, p. 27 and Austr. Zool. ii, 2, 1921, p. 28, pl. ix, fig. 99c. *Id.* Lord, Proc. Roy. Soc. Tasm. 1922 (1923), p. 64. *Id.* Lord & Scott, Verteb. Anim. Tasm. 1924, p. 40. *Id.* Whitley, Rec. Austr. Mus. xv, 1927, p. 293. *Id.* Scott, Proc. Roy. Soc. Tasm. 1933 (1934), p. 39.

A dry specimen (Austr. Mus. regd. no. IA. 6562) was found washed ashore at Lindeman Island, Queensland, by M. Ward; a record which considerably extends the known range of this species, which was hitherto known only from New South Wales southward to Tasmania.

Family MELANOTÆNIIDAE.

LOMANETIA, gen. nov.

Orthotype, *Melanotœnia multisquamata* Weber and Beaufort, Fish. Indo-Austr. Archip. iv, 1922, p. 290, from the Idenburg River, north New Guinea = *Lomanetia multisquamata*.

Mouth-opening with a very slight downward curve, when viewed from front: jaws equal. More than twenty-four predorsal scales and thirty-seven or more scales on the lateral line. Base of anal fin longer than distance from origin of first dorsal to end of second. Pectorals not as long as head, but much longer than head without snout.

Family EPINEPHELIDAE.

Genus **EPINEPHELUS** Bloch, 1793.

EPINEPHELUS HOEDTII (Bleeker).

Serranus hoedtii Bleeker, Nat. Tijdschr. Ned. Ind. viii, 1855, p. 406. Amboina, East Indies.

Epinephelus hoedti Bleeker, Atlas Ichth. vii, 1875, p. 45, pl. cclxxxiii, fig. 2 (plate published 1870).

D. xi/16 ; A. iii/8 (9). Brown, with many small dark brown spots, also a dark " moustache " mark ; margins of vertical fins narrowly edged white.

Localities.—One, 18 inches long, from Goat Island, Moreton Bay (F. W. Moorhouse) ; Qld. Mus. regd. no. I. 5194. Another 13 inches long from Bulwer, Moreton Island (G. Wise) is I. 5240. This species is also known from New South Wales.

Family APOGONIDAE.

FODIFOA, gen. nov.

Orthotype, *Foa fistulosa* Weber.

Differs from the true *Foa* notably in having a subcutaneous tube on each side posteriorly like that developed in *Adenapogon* and *Siphamia*, and which Weber considered was a hydrostatic apparatus.

FODIFOA FISTULOSA (Weber).

Foa fistulosa Weber, Notes Leyden Mus. xxxi, 1909, p. 162. Sumbawa, East Indies. *Id.* Weber, Siboga-Exped., Fische, 1913, pp. 235, 237 & 244-247, pl. x, fig. 6, and text-fig. 57. *Id.* Weber & Beaufort, Fish. Indo-Austr. Archip. v, 1929, p. 352, fig. 82. *Id.* Whitley, Great Barr. Reef Exped., Sci. Rept. iv, 9, 1932, p. 284.

One specimen (Austr. Mus. regd. no. IA. 6832) was trawled off Shaw Island, Cumberland Group, in about 10 fathoms, on September 4th, 1935. In life, it was brilliant silvery, with darker brown markings, formed by large densely grouped chromatophores. Eye brown. Peritoneal tubes silvery. Fins white. Base of ventrals black.

New record for Australia.

Family SPARIDAE.

Genus **PARADENTEX** Bleeker, 1872.

Gymnocranius Klunzinger, Verh. K. K. Zool. Bot. Ges. Wien xx, 1870, p. 764. Haplotype, *Dentex rivulatus* Rüppell. Preoccupied by *Gymnocranus* Heine, Journ. für Ornith. viii, 1860, p. 191, a genus of birds.

Paradentex Bleeker, Atlas Ichth. vii, 1872, pl. cccviii, fig. 3. Haplotype, *P. microdon* Bleeker. *Id.* Bleeker, Verh. Akad. Amsterdam xiii, 1873, p. 1. *Id.* Bleeker, Arch. Neerl. Sci. Nat. xi, 1876, pt. i, p. 278—*fide* Weber & Beaufort, Fish. Indo-Austr. Archip. i, 1911, p. 289.

Gymnocranius Bleeker, Verh. Akad. Amsterdam xiii, 1873, p. 41. *Id.* Bleeker, Atlas. Ichth. viii, 1877, p. 95. *Id.* Ogilby, Mem. Qld. Mus. v, 1916, p. 170. *Id.* Fowler, Bull. U. S. Nat. Mus. 100, xii, 1933, p. 129.

Gymnocranius is preoccupied and may require a new name if regarded as distinct from *Paradentex*, but I am not disposed to accord them even subgeneric rank at present. Both forms are represented in Australia and may be distinguished by the presence or absence of wavy blue lines on the sides of the face. A remarkable specimen, apparently aberrant, with a peculiar maxillary outgrowth is described hereunder as a variety. Key to the Australian kinds :—

A. A series of blue wavy bands on the cheeks ("*Gymnocranius*").
  B. Maxillary smooth, largely slipping under pre-orbital. Anal spines gradually increasing in length backwards .. .. *marshalli.*

AA. Cheeks without any wavy bands (*Paradentex*).
  C. Maxillary smooth, slipping under pre-orbital. Anal spines gradually increasing in length backwards .. .. *bitorquatus.*
  CC. Maxillary with a bunch of bony prickles above. Second anal spine thickened, only half the length of the third .. .. *bitorquatus*, var.

There are also minor differences in the number of scales over the lateral line, nuchal scales, proportions of head and depth into length, even curve or gibbosity of profile, and coloration between these and the extra-Australian species of *Paradentex*.

PARADENTEX MARSHALLI, sp. nov.

Dentex rivulatus Rüppell, Neue Wirbelth. Abyssin. (12), 1838, p. 116, pl. xxix, fig. 2. Djedda, Red Sea. Name preoccupied by *Dentex rivulatus* Bennett, Proc. Zool. Soc. Lond. iii (30), Sept. 1835, p. 91, from Trebizond.

Gymnocranius rivulatus Klunzinger, Verh. K. K. Zool. Bot. Ges. Wien xx, 1870, p. 765 and Fische Rothen Meeres, 1884, p. 36 (Red Sea).

? Dentex robinsoni Gilchrist & Thompson, Ann. S. Afr. Mus. vi, 1908, p. 226. Natal, S. Africa. *Id.* Barnard, Ann. S. Afr. Mus. xxi, 2, 1927, p. 712. Said to be a synonym of Rüppell's species, but original description differs in L. lat., coloration, size, etc. and is even more unlike the Australian specimen described hereunder.

Gymnocranius robinsoni Fowler, Bull. U.S. Nat. Mus. 100, xii, 1933, p. 133 (references and synonymy).

Br. 5. D. x/10 (11) ; A. iii/11 ; P. ii/12 ; V. i/5 ; C. 15. L. lat. 50. L. tr. 7/1/17. Five gill-rakers on lower half of first gill-arch.

Head (6 in.) $3\frac{1}{3}$, depth of body ($7\frac{1}{4}$) less than 3 in length without caudal (1 ft. 8 inches). Eye ($1\frac{3}{8}$) 4·3, interorbital ($2\frac{1}{4}$) 2·6, preorbital ($2\frac{1}{8}$) 2·8 in head. Pectoral $4\frac{3}{8}$ in. Length 2 ft. overall.

Maxillary largely sheathed under preorbital, supplementary bone not apparent. Lips fleshy, fimbriate. Peglike teeth in a single series in each jaw but there are also patches of coarse villiform teeth behind each side of the symphyses. Palate

toothless. Preoperculum not notched ; opercles entire. Four rows of cheek-scales ; two or three rows of nuchal scales. No scaly sheaths to fins ; vertical fins pointed. Second anal spine much shorter than third (about ½ of it). Ventrals reaching beyond vent.

General colour (in formalin) pearly grey and silvery. Cheeks and snout crossed by about ten wavy bluish bands. When the fish was fresh, Mr. T. C. Marshall noted the colours as : " General colour silvery with purplish reflections ; numerous narrow wavy blue lines before and below eye. All fins hyaline with traces of pale green. Edges of dorsal and caudal and also anal, orange. Inside of mouth pale orange. These colour notes were made on arrival of the specimen in Brisbane from Townsville when the fish had been on ice about three or four days."

Described from the holotype of the species, upon which the specific name *marshalli* is based, in honour of Mr. T. C. Marshall of the Queensland Museum, who had determined the specimen as a new species of *Gymnocranius*. It is two feet in total length and was obtained by Mr. George Coates from Rib Reef, near Townsville, north Queensland. Registered no. in the Queensland Museum, I. 5284.

This species is not unlike Rüppell's *Dentex rivulatus*, but as that name is preoccupied, and the Red Sea species even differs from the African *D. robinsoni* as described by Gilchrist & Thompson, the Australian form at least requires a new name.

PARADENTEX BITORQUATUS (Cockerell).

Gymnocranius bitorquatus Cockerell, Mem. Qld. Mus. v, July 10, 1916, p. 56. *Ex* Ogilby MS. Moreton Bay, Queensland (scales).

Gymnocranius audleyi Ogilby, Mem. Qld. Mus. v, July 10, 1916, p. 170, pl. xxii. Snapper banks off Moreton Bay, Queensland.

The double naming of this species was overlooked by Ogilby because he was unfortunately ill when volume v of these Memoirs was being printed.

The Australian Museum has Queensland specimens (Nos. I. 11133, 11134, 14037, IA. 3096, 6158, and 6583) from Bustard Bay ("Endeavour "), Great Barrier Reef (Lockwood), and Lindeman Island (M. Ward ; G. P. Whitley).

PARADENTEX BITORQUATUS, var.

(Text-figure 1.)

A remarkable form in the Queensland Museum is evidently referable to this species ; it has, however, bony features about the upper jaws and anal spines which may be due to senility. I have inspected the specimen, which was brought before my notice several years ago by Mr. T. C. Marshall who has furnished the following particulars :—

" D. x/10, 1 ; A. iii/10, 1 ; P. i, 13 ; scales 44 on lateral line to caudal base and 2 more on latter ; 5 above, 17 below ; a lanceolate scale placed above the base

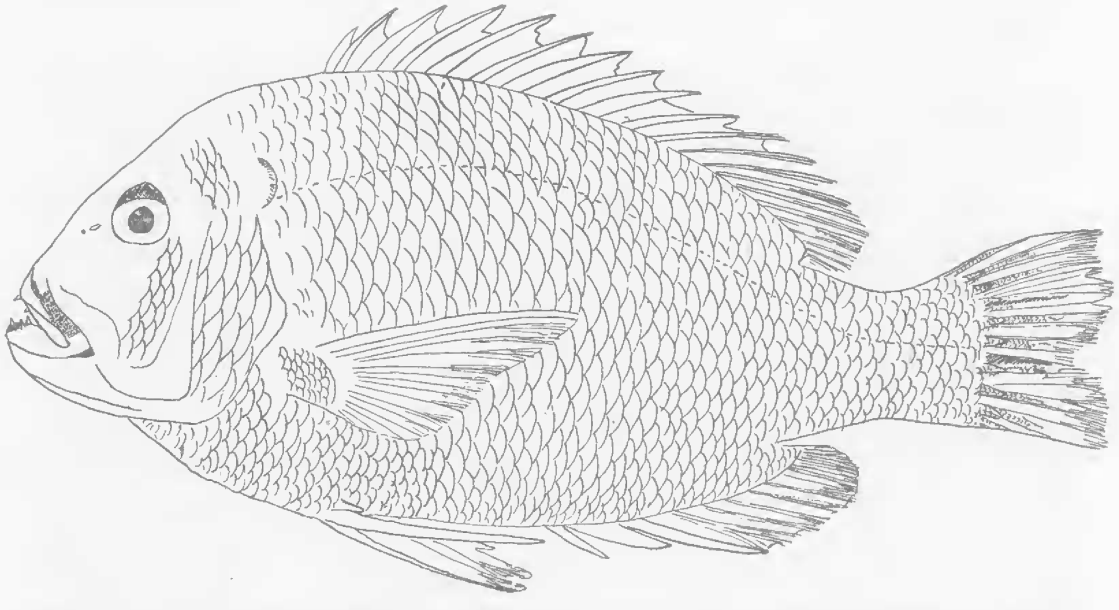
of the ventral spine. . . Tail with small scales almost over its entire length. Crown of the head and interorbital region naked. Operculum and preoperculum scaly. A rough bony rasp on the maxillary, measuring approximately 37 mm. in length.

" No teeth on vomer or palatines. Villiform teeth in a band on upper and lower jaws, with an outer row of anterior canines (6 above and 4 below). There is also an inner row of much shorter posterior canines on the bottom jaw.

" Dorsal, ventral and anal spines very stout and strong, the second anal spine being the stoutest (9 mm. for half its length).

" Colour silvery. Very similar in appearance to the common *Sparus australis*, except that it lacked the golden bands sometimes found in that species. The webs of the spinous and soft dorsal were suffused with bright yellow. Length $23\frac{1}{4}$ inches. Weight $9\frac{1}{2}$ lb."

Locality.—Forty-five miles north-east of Double Island Point, South Queensland ; caught by Mr. S. Williams early in 1933. Queensland Museum registered no. I. 5011.



Text-fig. 1.—*Paradentex bitorquatus* (Cockerell) var. Aberrant specimen, $23\frac{1}{4}$ inches long, from 45 miles N.E. of Double Island Point, Queensland. Qld. Mus. regd. no. I 5011.

T. C. Marshall del.

Family SARDIDAE.

Genus **THUNNUS**, South, 1845.[1]

Thynnus, Cuvier, Règne, Animal, ed. 1, " 1817 " = Dec. 1816, p. 313. Tautotype, *Scomber thynnus* Linné. Preoccupied by *Thynnus* Fabricius, Syst. Ent. 1775, p. 360, gen. 113, a genus of wasps.

Thunnus South, Encycl. Metropolitana xxv. 1845, p. 620. Substitute name for *Thynnus* Cuvier preoccupied. Genotype, *Scomber thynnus* Linné. [" *Thunnus* " Oken (Allgem. Naturg. x, 6, 1836, p. 193) and " *Thinnus* " Agassiz (Nomencl. Zool. 1846, Index Univ. p. 369) are not valid generic names, being merely cited ex pre-Linnean authors.]

Albacora Jordan, Proc. Acad. Nat. Sci. Philad. 1888, p. 180. Substitute name for *Thynnus* Cuvier, preoccupied. Orthotype *Scomber thynnus* Linné. *Id.* Whitley, Rec. Austr. Mus. xix, 1933, p. 81.

THUNNUS NICOLSONI, sp. nov.

(Text-figure 2.)

Br. 7. D. xiii/14 + 9 ; A. 13 + 9 ; P. 36 ; V. i/5 ; C. 22.

Head ($7\frac{1}{2}$ inches) 3·7, depth of body (about 6) 4·7, distance from snout to dorsal origin (8) 3·5, from ventral to anal origin (8) 3·5, in length to end of middle caudal rays (28). Eye (1) 7·5, interorbital ($2\frac{1}{2}$) 3, postorbital ($4\frac{1}{4}$) 1·8, maxillary ($2\frac{3}{4}$) 2·7, pectoral (6) 1·2, height of anal (4) 1·9, longest (1st and 2nd) dorsal spines ($3\frac{1}{4}$) 2·5, length of caudal keel ($3\frac{1}{4}$) 2·5, ventrals (3) 2·5 in head. Tips of caudal fin 9 inches apart.

The general habit of head, body, and fins as in tunnies generally. Eye large. Small compressed conic teeth in a single series in jaws. A slender strip of villiform teeth on each palatine and a pear-shaped patch on the vomer. Branchiostegal

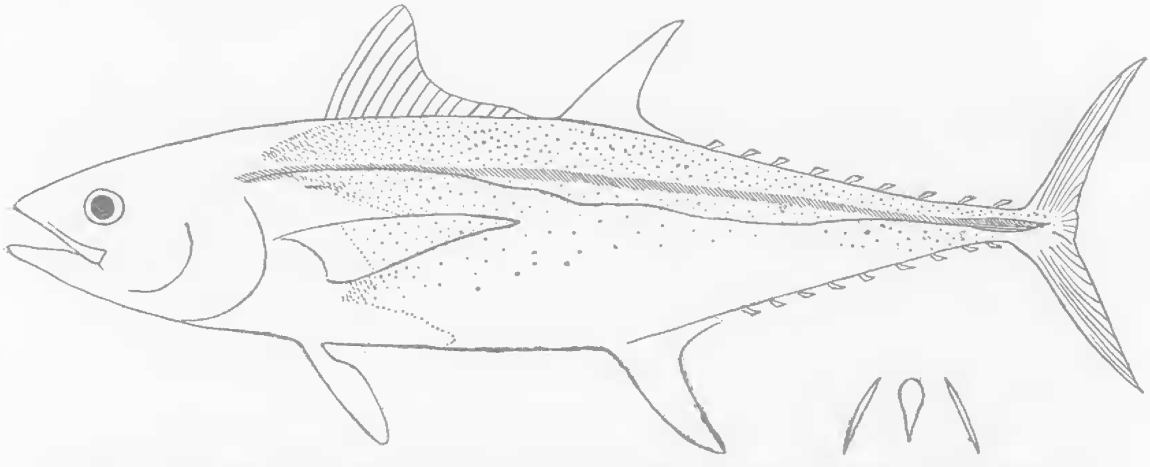
[1] Sherborn, when compiling his " Index Animalium," was unable to find the name *Thunnus* in the Encyclopaedia Metropolitana, volume v, the reference usually cited for it. I too searched in the Mitchell Library, Sydney, without finding where South proposed the name *Thunnus*. I had come to the conclusion that, as *Thynnus* and *Thunnus* were practically interchangeable, and as both words were used by classical authors (Aldrovandi, for instance), the reference to South was mythical, and so, in 1933, I employed the name *Albacora* Jordan for the tunny. Mr. Ludwig Glauert, of the Museum at Perth, Western Australia, then kindly wrote regarding the Encyclopaedia Metropolitana (*in lit*, 28 April, 1934) :—" As we have a copy of this work in our Library, I thought I would investigate the matter for myself. I turned up the general index and found a reference to *Thunnus* in volume 25, where on page 620 South writes :—' Cuvier has applied the word *Thynnus* generically to these fish, but as it had been long before used by Fabricius as the title of a genus of hymenopterous insects, it will be better to use the corresponding word *Thunnus* to prevent confusion.' I think this is the reference for which you and Sherborn have been seeking, and so I am writing to direct your attention to it." Again referring to the Mitchell Library set, I found that Mr. Glauert had indeed tracked down South's name, which occurred in the Encyclopaedia Metropolitana (edition of Smedley, Rose and Rose), vol. xxv, (Miscellaneous and Lexicographical, vol. 12), London, 1845, Zoology by J. F. South, Esq., F.Z.S., Surgeon to St. Thomas' Hospital. The species of *Thunnus* mentioned by South were all taken from Cuvier : *vulgaris*, *brachypterus*, *coretta*, *thunnina*, *brasiliensis*, *brevipennis*, *pelamys*, *alalonga*, *pacificus* (*germon*), *argentivittatus*, and *balteatus*. My thanks are due to Mr. Glauert for tracing this obscure reference. In this connection, I note that Gill (Proc. U.S. Nat. Mus. xvi, 1893 (1894), p. 693) has independently arrived at the same conclusions regarding *Thunnus*.

membrane produced into a backwardly directed point. Seven branchiostegal rays. Pseudobranchiae present. Gill-rakers long and depressed, 6 + 16 on first branchial arch.

Body fusiform, streamlined. It is largely scaly but the corselet area is obscure and naked, and the breast is naked to well behind the paired fins. There are some large scales near the shoulder region. A well marked caudal keel present.

The stomach contained the " pen " of a squid (*Sepioteuthis*), also the remains of some very small fish. Gonads 6″ long.

Peritoneum greyish or pinkish. A second specimen, caught a few days later, had D. xiii/13 + 2 + 8 ; A. 13 + 8.



Text-fig. 2.—*Thunnus nicolsoni* Whitley. Holotype, 30 inches long, and palatal dentition of same, from Lindeman Island, Queensland. Austr. Mus. regd. no. IA. 6553.
Gilbert Whitley del.

Colours when fresh : Dark iridescent blue to dull grey on the back, pearly silvery on flanks, and silvery greyish or white, with greenish reflections, towards belly. A distinct narrow violet band runs directly from the shoulder to above the caudal keel, passing dorsally of the lateral line. Iris pearly ; pupil of eye black. Fins mostly smoky and greyish. Inside of pectoral much darker than outer surface, which is more silvery. Tinges of yellow on dorsal and anal lobes and on membranes of ventrals. Dorsal and anal finlets mostly yellow with whitish margins and grey inframarginal bands.

Described and figured from the holotype of the species, a specimen 30 inches in total length and 12 lb. in weight, caught by Mrs. Norman Strelitz on a white feather lure in two fathoms depth, between Lindeman and Maher Islands, Cumberland Group, North Queensland. Head preserved in formalin ; Austr. Mus. regd. no. IA. 6553. Aboriginal name : Geegorry, pronounced with the g's hard.

I have much pleasure in naming this fine new Tunny after Captain Angus de Salis Nicolson of Lindeman Island in appreciation of his interest and help extended to me during my stay on the island.

Genus **CYBIUM** Cuvier, 1829.

Cybium Cuvier, Règne Animal ed. 2, ii, April 1829, p. 199. Logotype, *C. commersonii* Cuvier = *Scomber commerson* Lacépède, selected by Gill, Proc. Acad. Nat. Sci. Philad. xiv, 1862 (1863), p. 126. *Id.* Cuvier and Valenciennes, Hist. Nat. Poiss, viii, 1832, p. 164. *Id.* Voigt, Das Thierreich (Cuvier) ii, 1832, p. 281. *Id.* Griffith, Anim. Kingdom (Cuvier) x, 1834, p. 185. *Id.* Swainson, Nat. Hist. Fish. Amphib. Rept. ii, July 1839, pp. 174 and 238. *Id.* Bleeker, Nat. Geneesk. Arch. Ned. Ind. i, 1844, p. 553—*fide* Weber and Beaufort. *Id.* Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 369. *Id.* Baudement, Dict. Univ. Hist. Nat (d'Orbigny), xii, 1861, p. 363. *Id.* Macleay, Proc. Linn. Soc. N. S. Wales, viii, 1883, p. 205 and ix, 1884, p. 28. *Id.* De Vis, Proc. Linn. Soc. N. S. Wales ix, 1884, p. 545. *Id.* Kishinouye, Journ. Coll. Agric. Imp. Univ. Tokyo, viii, 1923, p. 415. *Id.* Jordan and Hubbs, Mem. Carneg. Mus. x, 2, 1925, p. 213. *Id.* Dolsman, Treubia xiii, 1931, p. 401 (eggs and larvae).

Cibium Troschel, Arch. f. Naturg. (Wiegmann), xv, i, 1849, p. 380 (gill-rakers).

Scomberomorus of Australian authors, non Lacépède.

I follow Jordan and Hubbs (1925) in reinstating *Cybium* as distinct from *Scomberomorus*. The genus *Scomberomorus* Lacépède (Hist. Nat. Poiss. iii, 1802, p. 292) has as its genotype *S. plumierii* Lacépède from Martinique, a synonym of *Scomber regalis* Bloch (Nat. ausl. Fische vii, 1793, p. 38, pl. cccxxxiii) from the Antilles. Absolute synonyms of *Scomberomorus* are *Polipturus* Rafinesque 1815, *Polypturus* Agassiz, 1845, and *Polypterurus* Agassiz, 1846. The typical American form was not very satisfactorily described by the early authors, but Fowler more recently gives the number of gill-rakers as 8-12 : dorsal spines as 17-18 and 30-40 teeth in each jaw.

Apart from these features, the American species has very different colours from the Australian ones usually called *Scomberomorus* and that name might well be dropped from our lists.

Cybium Cuvier was proposed for a number of species, the first of which, *Cybium commersonii* Cuvier = *Scomber commerson* Lacépède (Hist. Nat. Poiss, ii, 1800, pp. 598 and 600, pl. xx, fig. 1) evidently from Mauritius, was selected as the genotype by Gill.

CYBIUM COMMERSON (Lacépède).

EXTRALIMITAL REFERENCES.

Scomber commerson Lacépède, Hist. Nat. Poiss. ii, 1800, pp. 598 and 600, pl. xx, fig. 1. Based on a drawing by Commerson. No locality, but Cuvier & Valenciennes designate Mauritius. *Id.* Cuvier, Règne Anim. ed. 1, ii, " 1817 " = Dec. 1816, p. 314, footnote.

Scomber commersoni Bloch & Schneider, Syst. Ichth. 1801, p. 545. *Ex* Lacépède. *Id.* Shaw, Gen. Zool. iv, 2, 1803, p. 589, pl. lxxxv, after Lacépède (" Pacific Ocean ").

Scomber maculosus Shaw, Gen. Zool. iv, 2, 1803, p. 592. Based on the " Konam " of Russell, Fish. Vizag. ii, 1803, p. 27, pl. cxxxv. Vizagapatam, India. *Id.* Shaw & Nodder, Nat. Miscell. xxiii, 1811, pl. 982.

Cybium commersonii Cuvier, Règne Anim. ed. 2, ii, April 1829, p. 200. *Ex* Lacépède and Russell. *Id.* Rüppell, Atlas Reise Rüpp., Fische, 1831, p. 94, pl. xxv, fig. 1 (Massowah, Red Sea). *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. viii, " 1831 " = Jan. 1832, p. 165 (Mauritius & India). *Id.* Rüppell, Neue Wirbelth. Abyssin. Fische, 1836, p. 41. *Id.* Bleeker, Nat. Geneesk. Arch. Ned. Ind. ii, 1845, p. 516 and later papers—*fide* Weber & Beaufort, Fish. Indo-Austr. Arch. i, 1911, p. 149. *Id.* Richardson, Rept. 15th. meet. Brit. Assn. Adv. Sci., 1845 (1846), p. 268 (China). *Id.* Cantor, Journ. Asiatic Soc. Bengal xviii, 2, 1850, p. 1090 ; Cat. Malay. Fish., 1850, p. 108 (Malaya). *Id.* Jerdon, Madras Journ. Lit. Sci., 1851, p. 136—*fide* Day, 1876. *Id.* Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 370 (Cape Seas, etc.). *Id.* Day, Fish. Malabar, 1865, p. 69. *Id.* Playfair, Fish. Zanzibar,

1866, p. 67. *Id.* Klunzinger, Verh. Zool. Bot. Ges. Wien xxi, 1871, p. 444 (Red Sea). *Id.* Day, Fish. India, 1876, p. 255, pl. lvi, fig. 5 (Madras spem. figd.). *Id.* Döderlein, Nat. Sicil. vii, 1872, pp. 105 & 129, fig. (*fide* Zool. Record). *Id.* Macleay, Proc. Linn. Soc. N. S. Wales viii, 1883, p. 266 (Hood Bay, New Guinea). *Id.* Klunzinger, Fische Rothen Meeres, 1884, p. 112. *Id.* Gilchrist, Mar. Invest. S. Afr. i, 1902, p. 128 (S. Africa). *Id.* Gilchrist & Thompson, Ann. S. Afr. Mus. vi, 1909, p. 248 (Natal spem. descr.). *Id.* Weber, Abhandl. Senck. Naturf. Ges. xxxiv, 1911, p. 31 (Aru Iss.). *Id.* Robinson, Mar. Biol. Rept. S. Africa iii, 1916, p. 63. *Id.* Gudger, Bull. Amer. Mus. Nat. Hist. lviii, 9, 1929, p. 517, nos. 173-174. *Ex* Pike MS. (Mauritius). *Id.* Delsman, Treubia xiii, 1931, p. 401 (Java Sea—eggs & larvae).

? Cybium clupeoideum Cuvier & Valenciennes, Hist. Nat. Poiss. viii, " 1831 " = Jan. 1832, p. 178. Norfolk Island.

? Scomber clupeoides Cuvier & Valenciennes, Hist. Nat. Poiss. viii, " 1831 " = Jan. 1832, p. 178. *Ex* Broussonet MS. Norfolk Island.

Cybium konam Bleeker, Nat. Tijdschr. Ned. Ind. i, 1851, p. 357. Batavia. *Id.* Kner, Voy. Novara, Fische, 1865, p. 144 (Manilla).

Scomber konam Day, Fish. India, 1876, p. 255, in synonymy. Latinization of the vernacular " Konam " of Russell. Vizagapatam.

Scomberomorus commersonii Swain, Proc. Acad. Nat. Sci. Philad. 1882 (1883), p. 306. *Id.* Jordan & Seale, Bull. U. S. Bur. Fish. xxv, 1906, p. 228 (New Guinea) *et ibid* xxvi, 1907, p. 13 (Cavite, Philippines). *Id.* Jordan & Dickerson, Proc. U. S. Nat. Mus. xxxiv, 1908, p. 610 (Suva, Fiji). *Id.* Gilchrist & Thompson, Ann. Durban Mus. i, 4, 1917, p. 395. *Id.* Thompson, Mar. Biol. Rept. S. Afr. iv, 1918, p. 112. *Id.* Barnard, Ann. S. Afr. Mus. xxi, 2, 1927, p. 802.

Cybium multifasciatum Kishinouye, Sui. Gak. Ho, i, 1915, p. 9, pl. i, fig. 3. Japan. *Fide* Kishinouye, 1923.

Cybium commerson Kishinouye, Journ. Coll. Agric. Univ. Tokyo viii, 3, 1923, p. 416, pl. xxii, fig. 36. (Japan). *Id.* Jordan & Hubbs, Mem. Carneg. Mus. x, 2, 1925, p. 214 (few gill-rakers and serrulate teeth).

Scomberomorus (*Cybium*) *commerson* Whitley, Journ. Pan-Pacif. Res. Inst. ii, 1, 1927, p. 5, no. 111 (Fiji).

Scomberomorus commerson Fowler, Proc. Acad. Nat. Sci. Philad. lxxix, 1927 (1928), p. 267 (Philippines). *Id.* Fowler, Mem. Bish. Mus. x, 1928, p. 132 (Oceania). *Id.* Fowler, Proc. Acad. Nat. Sci. Philad. lxxxvii, 1935, p. 138, fig. 104 (Siam) *et ibid.*, p. 380 (Natal).

Scomberomorus (*Scomberomorus*) *commersoni* Deraniyagala, Ceylon Journ. Sci., (B) xviii, 1933, p. 40, pl. i, fig. 1 & text-fig. 1 (Ceylon).

AUSTRALIAN REFERENCES.

" *A Fish of the Tunny kind* " Dampier, Voy. New Holland iii, 1703, p. 162, pl. iii, fig. 5. New Holland [Probably Shark's Bay, W. Australia].

Cybium commersonii Castelnau, Proc. Linn. Soc. N. S. Wales iii, 1879, p. 352 (Sydney, N. S. Wales). *Id.* Macleay, Proc. Linn. Soc. N. S. Wales v, 1881, p. 558 (Port Jackson), and Cat. Austr. Fish. i, 1881, p. 193. *Id.* Ogilby, Rept. Comm. Fisher. N. S. Wales 1886 (1887), Append. A, Cat. Fish. N.S.W., 1886, p. 29. *Id.* McCoy, Prodr. Zool. Vict., dec. xvi, 1888, p. 205, pl. cliv Queenscliff, Victoria). *Id.* Lucas, Proc. Roy. Soc. Vict. (2) ii, 1890, p. 26.

Scomberomorus commersonii Waite, Mem. N. S. Wales Nat. Club ii, Nov. 7, 1904, p. 42. *Id.* Stead, Fish. Austr., 1906, pp. 162 & 264, and Ed. Fish. N. S. W., 1908, p. 98, pl. lxvi & cover design. *Id.* Ogilby, Commerc. Fish. Qld. 1915, p. 36. *Id.* McCulloch, Austr. Zool. ii, 3, 1922, p. 105, fig. 292a (after Day); Austr. Zool. Handbook i, 1922, p. 79, fig. 292a. *Id.* McCulloch & Whitley, Mem. Qld. Mus. viii, 1925, p. 142.

Scomberomorus commerson Whitley, Austr. Zool. iv, 4, 1926, p. 206 (North-West Islet, Qld.). *Id.* Paradice, Mem. Qld. Mus. ix, 1927, p. 82 (Pellew Is., N. Australia). *Id.* Whitley & Boardman, Austr. Mus. Mag. iii, 1929, p. 368 (near Low Isles, Qld.). *Id.* Roughley, Mid-Pacific Mag. xxxviii, 1929, p. 518 & fig. *Id.* Yonge, A Year on the Great Barrier Reef, 1930, p. 215. *Id.* Stephenson, Gt. Barr. Reef Exped. Sci. Rept. iii, 1931, p. 77. *Id.* Whitley, Gt. Barr. Reef Exped. Sci. Rept. iv, 1932, p. 289.

I have given above a fairly extensive series of references for future students as it is felt that this Australian Seerfish (known as Kingfish or Banded Tuna in Queensland and as Spanish Mackerel or Leaping Tuna in New South Wales) may be more critically studied at some later date owing to its economic importance. This nomadic surface fish has been recorded from a very wide range and may not belong to one homogeneous species, the breeding habits and migrations, so far as known, suggesting that it may be divisible at least into subspecies and races when series of specimens can be compared. Whilst Australian specimens generally differ markedly from figures of Indian and other extralimital ones, they vary to some extent amongst themselves and it is very difficult to find differences which can be used as criteria. I have made notes from freshly-caught specimens over a number of years and have compared these with published accounts, but am not yet convinced of the distinction of the Australian ones, which may require re-naming when they, and such nominal forms as are synonymised above, are better known. These fishes recall the Sun-fishes of the genus *Ranzania* in their puzzling variation and wide distribution. Whilst they are doubtless migratory, limits to their travel are apparent, and these fine fishes are not, so far as records go, found very far away from the continental land-masses.

Lacépède's original description is rather diffuse, forming part of a general account of the genus *Scomber*, but his specific characters are : The body very elongate ; ten little fins quite distinct from one another, above and below the tail ; the first dorsal fin long and very low ; the second short, emarginate, and almost the same as the anal ; the lateral line destitute of little bucklers (*plaques*). Lacépède's description having been based on a drawing, he only mentions incidentally the large teeth, general shape and proportions, etc. which appear in the figure, and gives 18 rays as the number in the first dorsal and 5 or 6 for each of the paired fins. The colour, he wrote, was like that of a mackerel, silvery, dark on the back, and variegated on the sides by numerous irregular blotches. More detailed descriptions of specimens from Mauritius would be desirable for comparison with our own forms.

I am unable to identify satisfactorily the species called *Cybium clupeoideum* Cuv. & Val., which has remained unrecognised for over a century. Again translating from French into English, I give the original description from the Hist. Nat. Poissons :

" Broussonet's collection has afforded us a *Cybium* from Norfolk Island, to the west [should be east—G. P. W.] of New Holland, which is there labelled *scomber clupeoides*, and which resembles *guttatum* in its compressed teeth and the form thereof, but which has no spots. It might be one of the two *koningsvisch* of Valentyn.[2]

[2] The account of the kingfish in Valentyn's *Amboina* is not detailed enough for specific determination.—G. P. W.

" I find in it fourteen or fifteen teeth on each side above, and twelve or thirteen below. Under the second dorsal, the lateral line descends at an angle of forty-five degrees, and rises again under the first finlet ; it waves a little until near the lateral keel.

" D. 14-2/15-ix ; A. 2/14-ix.

" This fish appears to be of a dark leaden colour on the back ; the flanks and ventral surfaces are silver ; its fins are grey or brown.

" It is only six or seven inches long."

There is no specimen in the Australian Museum from Norfolk Island which can be identified as this species, which may be nearer the Australian *Cybium guttatum* or *C. semifasciatum* than *C. commerson*.

The first published figure identifiable as *Cybium commerson* is that of Dampier ; it represents the Western Australian form of the species and was probably caught in Shark's Bay in the year 1699. Dampier remarks :

" This is a Fish of the Tunny kind, and agrees well enough with the Figure in Tab. 3. of the Appendix to Mr. *Willughby's* History of Fishes under the Name of *Gurabuca* ; it differs something, in the Fins especially, from *Piso's* Figure of the *Guarapucu*."

Mr. L. Glauert recently received a specimen for the Perth Museum, confirming the existence of this species in Western Australia.

The remaining synonyms and identifications quoted in the above synonymy do not call for special mention here, though several of the authors quoted named their specimens with some reservation. Also the late A. R. McCulloch, studying specimens from New South Wales, thought they " may perhaps be new " and made a MS. description of a specimen caught off Port Stephens along with others, in February 1913 by Dr. M. Lidwill :

" D. xv, 3/12, xi ; Anal, damaged, ? 3/14, x. Pectoral 23. Length from tip of snout to end of middle caudal rays 1210 mm. Head from tip of snout to end of bony operculum, 235 mm. Height about 203. Eye 30. Snout from tip to posterior nostril, 90. Bony interorbital space, 71. Second dorsal spine, 52. Depth of caudal peduncle, 42. Pectoral, 155. Ventral, 53.

" Dorsal, pectoral, and ventrals beginning approximately on the same vertical line. Anterior spines of first dorsal highest, decreasing in length backwards. Second dorsal commencing far in front of anal, terminating above middle of that fin ; its posterior rays are connected with the first finlet. Anterior rays damaged. Anal originating below middle of dorsal, much damaged, its posterior rays connected with the first finlet.

" Maxillary reaching a trifle behind the hinder ocular margin. Lateral line nearly straight to end of dorsal, thence curving down to below middle of body, whence it rises to middle of caudal peduncle. Microscopic teeth are present on the vomer, palatines and tongue."

My own field notes, made in Queensland, are as follows :—

Specimen from North-West Islet, Queensland ; December 1925.—As we were passing Tryon Island we drew near the breakers on the end of the North-West Islet reef, about five miles from land. After a slight delay, caused by engine breakdown, we caught a Barred Spanish Mackerel (*Scomberomorus commerson*), Leaping Tuna of the fishermen. It must have weighed 20 lb. at least and leapt well out of water.

Colours from life.—Iridescent steel-blue above, silvery on sides, with many oblique brownish bars which taper ventrally. Fins and finlets dusky ; first dorsal membranes bluish black. Tail silvery green, dark-tipped. Keel on caudal peduncle dark grey. Lateral line yellowish. Iris burnished golden.

D. xvi/ii, 15 ? + 10 ; A. iii/i, 11 ? + 10 finlets.

Anterior dorsal spines longest. A single row of triangular teeth in each jaw. Villiform teeth on vomer and palatines. Maxillary extending backwards to vertical of posterior ocular margin. Mandible slightly projecting. Scales very minute.

Some flesh was put on ice and we had it boiled for lunch next day. It was firm and white, but not tasty, being mealy, dry, and flavourless. It was better when mixed with turtle soup.—G. P. W., Diary, 3/12/25.

Specimens from near Low Isles, Queensland, Sept. 5, 1928.—Some fishermen damaged the propeller of their launch on coral and had to put in here [Low Isles] from Snapper Island. They had 26 kingfish (*Scomberomorus commerson*) which we photographed. These fish were about 9 or 10 lbs. in weight when cleaned and are developing the reproductive organs. The fishermen say they begin to get them here about June or July when they come up from the south. In about another month they will be larger and mature and spawn about November. They are caught here until December, when they go south again. A " lily " or a piece of white or red rag is used as bait and trolled behind a launch. They bite very ferociously and are often caught in numbers. Yet they do not stay in one place and may not be encountered the day after a good catch has been made. All the fish they had had been caught between Snapper Island and here. Seven pence a pound is asked for the cleaned fish.—G. P. W., Diary, 5/9/28.

Specimens from North-West Islet, Queensland ; May 1931.—Several specimens, the largest weighing eighteen pounds.

D. xvi/16 + 10 finlets ;	A. 16 + 10.
xvi/15 + 10	17 + 10
xvi/17 + 9	17 + 9

Head (4½ in. or 105 mm.) 4·5, depth (88 mm.) 5·4 in standard length (19 in. or 475 mm.). Eye (15 mm.) 7 in head. Upper caudal lobe slightly shorter than head. Steel-blue above, silvery on sides and ventral surface. Dorsal, pectorals, and caudal dark grey. The subvertical greyish bars do not extend much below level of mouth.—G. P. W., Diary, 22 May, 1931.

Specimens from Lindeman Island, Queensland, 1935—

(*a*) D. xvi/16-9 ; A. iii, 14-9 ; P. ii/20 ; V. i/5 ; head about 12 in. Depth about 9 in. Total length 4½ ft. Pectoral 8 in. Eye, 1½ in. Weight 45 lbs. Crossbands from level of anterior part of lateral line downwards, but ceasing before ventral surface is reached ; there are over 50 transverse bars but some are bifurcated and others broken up into spots. 28/7/35.

(*b*) D. xvi/16-9 ; A. 16-9. A " School mackerel," two feet long. Spinous dorsal almost uniform dark grey. Body *spotted* posteriorly, but the spots become elongated to form ten subvertical blotches before level of soft dorsal and anal. 7/8/35.

(*c*) D. xv/16-9 ; A. 16-10. Length 2 ft. 2 in. Similar to (*b*) but crossbands even more pronounced. In neither does the maxillary extend behind the eye. 7/8/35.

Another spotted specimen appeared to be different from the above examples and belongs to the *semifasciatum* form, q.v., *infra*.

Owing to their large size, these fishes have to be studied in the field. The Australian Museum has but few specimens. One however, from between Port Glasgow and Suau Island, Papua, was presented by Mr. Melbourne Ward (No. IA. 5679). It has about thirty-five wavy bands extending to near the ventral surface.

Many popular articles on the " Kingfish " and its capture have appeared in local magazines, papers and angling journals, but of these I shall quote only two. The first is an account by Mr. William Dearness of Townsville, Q., which appeared in the " Orcadian " of January 24, 1935, to which my attention was kindly directed by Dr. Charles Anderson, and the second is from the " Daily Telegraph " (Sydney) of November 8, 1935. Mr. Dearness, evidently writing towards the end of 1934, stated : " The King Fish, or Spanish Mackerel, season is about finished. The visiting boats are returning home, two from Brisbane and two from Rockhampton. They have had a good season and are returning with big cheques. This is the first season that any visiting boats have taken part in the fishing. It was in 1911 when it was first started here. A lighthouse-keeper at Cape Cleveland had been doing a bit of fishing, and caught two and sent them into town, and they were put in a fish shop window as a curio. They had doubts about them being edible owing to their lack of scales. However they got over that and now it is a big industry. They come in on the Queensland coast as far north as Cairns and as far south as Mackay. They

are most plentiful from Palm Islands to Cape Upstart. . . . Average weight of fish 40 to 50 lbs. The biggest one caught so far was 94 lbs. . . . They catch from 1,000 lbs. up to one ton at a time, and then come in and dispose of their catch. . . . The fishermen get fourpence a pound. The fish shops here sell at 1s. a lb., and Rockhampton and Brisbane 1s. 4d. a lb. Any fish not disposed of is smoked. . . . The mackerel come in on this coast for about four months and then disappear, and nobody seems to know where they go."

After a general account of the fishing, the " Daily Telegraph " stated: " Record hauls have been secured this season, and within five days from October 27 to November 1 southern boats railed seven tons of fish to southern markets, while five Townsville fishing boats within the same period landed to local cold storage works catches of 800 to 2,000, and of a total weight of 7,300 lb."

It should be possible for hundreds of specimens to be examined where only a few have been inspected before, so that the Australian fish may receive the same necessary scientific study that the tunnies and other large food-fishes are receiving in other parts of the world, and it is hoped that some biologist will perform this work in the near future. Characters which should be noted, as they may prove to be of diagnostic value, are the number of spines, rays, and finlets; the number of teeth and whether they are ever serrulate; the extent of the colour-markings correlated with growth; the proportions of the parts of the head (eye, jaws, snout, etc.); the course of the lateral line; degree of compression and relation of depth to length; and the number of vertebræ. Stomach contents and condition of gonads should, of course, also be noted for each specimen, with full particulars of locality, and time of capture, and observations made as to relative abundance and direction of movements.

CYBIUM GUTTATUM (Bloch and Schneider).

Scomber guttatus Bloch and Schneider, Syst. Ichth. 1801, p. 23, pl. v. Tranquebar, Madras, India. *Id.* Cuvier, Règne Anim. ed. 1. ii, " 1817 " = Dec. 1816, p. 314. footnote.

Scomber leopardus, Shaw, Gen. Zool. iv, 2, 1803, p. 591. Based on " Wingeram " Russell, Fish. Vizag, ii, 1803, p. 26, pl. cxxxiv, Vizagapatam, Madras, India.

Scomber wingeram Schinz, Das Thierreich (Cuvier), ii, 1822, p. 506, footnote. Based on Russell's " Wingeram."

Cybium interruptum Cuvier and Valenciennes, Hist. Nat. Poiss. viii, " 1831 " = Jan. 1832, p. 172. Pondicherry, Madras, India.

Cybium guttatum Cuvier and Valenciennes, Hist. Nat. Poiss. viii, " 1831 " = Jan. 1832, p. 173. (Pondicherry and Malabar). *Id.* Bleeker, Nat. Geneesk. Arch. Ned. Ind. ii, 1845, p. 516 and later papers—*fide* Weber and Beaufort, Fish. Indo-Austr. Archip. i, 1911, p. 149. *Id.* Richardson, Rept. 15th meet. Brit. Assn. Adv. Sci. 1845 (1846) p. 268 (China). *Id.* Cantor, Journ. Asiatic Soc. Bengal xviii, 2, 1850, p. 1093 and Cat. Malay Fish. 1850, p. 111 (Penang to Calcutta). *Id.* Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 371. *Id.* Kner, Voy. Novara, Fische, 1865, p. 143. *Id.* Day, Fish. India, 1876, p. 255, pls. lv, fig. 1 and lvi, fig. 4 (Canara and Madras). *Id.* Macleay, Proc. Linn. Soc. N. S. Wales v, 1881, p. 559 and Descr. Cat. Austr. Fish i, 1881, p. 194 (Port Jackson, N.S.W.—descr. copied from Gunther). *Id.* Ogilby, Cat. Fish. N. S. W., 1886, p. 30. *Id.* Hutton, Trans. N. Z.

Inst. xxviii, 1896, p. 315 (Chatham Islands—record very doubtful). *Id.* Rendahl, K. Svenska Vet. Akad. Handl. lxi, 9, 1921, p. 16 (Broome, W. Austr.). *Id.* Kishinouye, Journ. Coll. Agric. Univ. Tokyo viii, 3, 1923, p. 419, pl. xxxiv, fig. 61. *Id.* Delsman, Treubia xiii, 1931, p. 402 and figs. (Java Sea ;—eggs and larvae).

Pelamys atripinnis Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 371. *Ex* Waterhouse MS. India.

Scomberomorus guttatus Swain, Proc. Acad. Nat. Sci. Philad. 1882 (1883), p. 306. *Id.* Fowler, Proc. Acad. Nat. Sci. Philad. 1904 (Jan. 1905), p. 766 (Sumatra). *Id.* Waite, Mem. N. S. Wales Nat. Club ii, 1904, p. 42. *Id.* Jordan and Seale, Proc. Davenport Acad. Sci. x, 1905, p. 6 (Hong Kong). *Id.* Waite Rec. Canterb. Mus. i, 1907, p. 24 (New Zealand). *Id.* Stead, Fish. Austr. 1906, p. 162, and Ed. Fish N. S. Wales 1908, p. 98 (N. S. Wales). *Id.* Ogilby, Commerc. Fish. Qld. 1915, p. 36 (Queensland). *Id.* McCulloch, Austr. Z ool. ii, 3, 1922, p. 105 and Austr. Zool. Handbook i, 1922, p. 79. *Id.* McCulloch and Whitley, Mem. Qld. Mus. viii, 2, 1925, p. 142. *Id.* Phillipps, N. Z. Mar. Dept. Fish. Bull. i, 1927, p. 45.

Scomberomorus (*Sawara*) *guttatus* Deraniyagala, Ceylon Journ. Sci. (B) xviii, 1933, p. 43, fig. 3 (Ceylon).

The typical form of this species from India has been well figured by Bloch and Schneider, Russell, and Day, and the Australian Museum has a small specimen from Madras. Whilst *Cybium guttatum* has been recorded from several Australian States, authors have not supplied descriptions of their specimens. Unfortunately, I have not much material (only two specimens supposed to have come from New South Wales), and most of the spotted *Cybium* examined from Australia have proved to be either young *commerson* or else the form known as *semifasciatum*. Hutton's record of *guttatum* from the Chatham Islands, upon which the inclusion of the species in New Zealand lists is based, is very doubtful. Even Kishinouye's beautiful figure of a Japanese specimen may not be true *guttatum*. Cantor regarded *Cybium kuhlii* Cuvier and Valenciennes as the young of *guttatum* but of this form I have only a few Malayan examples presented by Mr. D. G. Stead, and one specimen from Sind, India, purchased from Dr. Francis Day. It is noteworthy that less has been written about *C. guttatum* than of *commerson*, and the former may have been confused at times with the young of the latter and both need comparison with *C. clupeoideum* Cuvier and Valenciennes.

The Spotted Spanish Mackerel was said to occur in prodigious schools in New South Wales (Stead), but Ogilby stated it was not common in the Brisbane markets and I have seen no Sydney specimens, so that its occurrence may be sporadic.

A sketch and notes in McCulloch's card-index represent a specimen 21½ inches long, purchased at a Brisbane fish shop on 15/7/1918.

Dark steel blue on back becoming lighter laterally, this colour is fairly sharply defined from the silver sides, especially posteriorly. Some large steel grey spots on the sides distributed asymmetrically but confined to the region between the soft dorsal and anal fins. Membrane of first seven dorsal spines blackish, the remainder white but black-tipped. Edges of soft dorsal blackish, the rest silver. Dorsal finlets dark. Caudal and pectoral blackish towards the margin. Eye golden. The remainder

silver." This Queensland fish differed from those figured from India, in having practically no spots anterior to the soft dorsal and anal fins and such spots as were present were not arranged in such regular rows, also the Australian sketch shows 10 dorsal and anal finlets.

An old photograph in the Australian Museum shows a specimen, probably from New South Wales, with large spots along the whole of the sides and ten dorsal and ten anal finlets. It is about fifteen inches in total length and the maxillary does not quite reach the vertical of the hinder orbital margin.

CYBIUM SEMIFASCIATUM Macleay.

(Text-figures 3-4.)

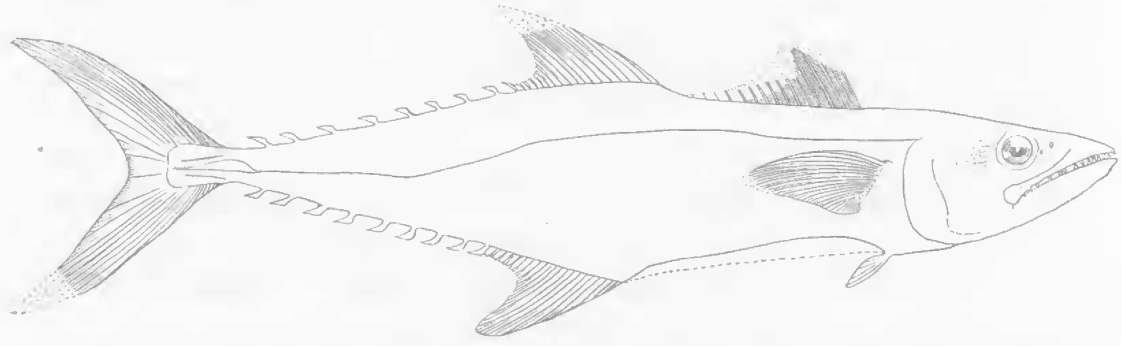
Cybium semifasciatum Macleay, Proc. Linn. Soc. N. S. Wales, viii, July 17, 1883, p. 205 and ix, 1884, p. 28. Lower Burdekin River, Queensland; salt water (coll. A. Morton, 1883). Holotype (No. A. 18288) in Austr. Mus., Sydney.

Cybium tigris De Vis, Proc. Linn. Soc. N. S. Wales, ix, Nov. 29, 1884, p. 545. Cape York, Queensland (coll. K. Broadbent). Holotype (No. I. 119) in Queensland Museum, Brisbane.

Cybium commersoni Saville-Kent, Great Barrier Reef 1893, pp. 291, 311, and 369, pl. xlvi, fig. 1. Probably not *Scomber commerson* Lacépède, 1802.

Scomberomorus tigris, and *semifasciatum* McCulloch and Whitley, Mem. Qld. Mus. viii, 2, 1925, p. 142. *Id.* McCulloch, Austr. Mus. Mem. v, 1929, p. 265 (listed only).

Macleay's type is a very shrunken specimen and is obviously conspecific with *Cybium tigris* De Vis. Figures of both types are given here, the differences between them being due either to variation or shrinking. Macleay's name is the earlier. The Australian Museum also has a specimen collected at Cairncross I., Qld. by Charles Hedley (No. IA. 1598), one obtained by me at Lindeman Island (IA. 6573), and a Cooktown specimen (A. R. McCulloch).

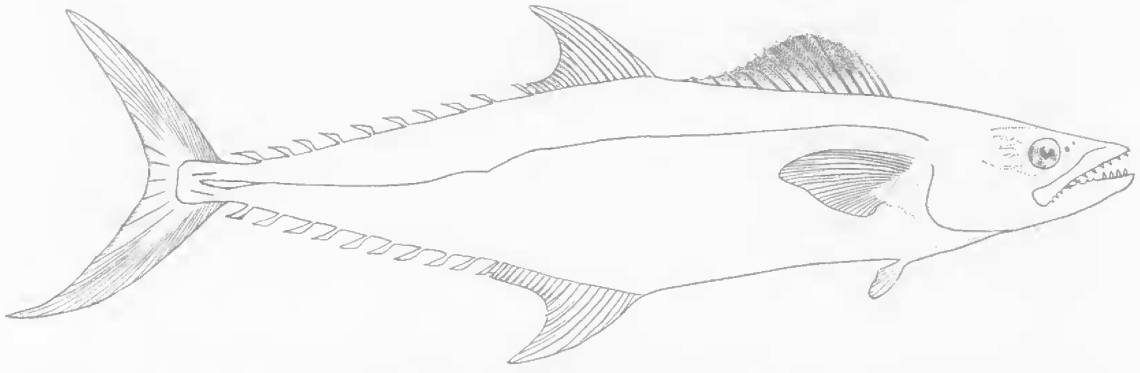


Text-fig. 3.—*Cybium semifasciatum* Macleay. Holotype, about one foot overall, from the Burdekin River, Queensland. Austr. Mus. regd. no. A. 18288. *Gilbert Whitley del.*

De Vis' original description of *Cybium tigris* was brief and his fin-formula inaccurate, so the following details, with a figure, have been drawn up from the holotype.

D. xiv/19 + 9; A. ii/19 + 9; P. ii/21; V. i/5; C. 19 + 5 + 19.

Head (60 mm.) 4·7, depth at origin of soft dorsal and anal fins (62) 4·6 in length to end of middle caudal rays (287). The distance from snout to hypural joint is 273 mm. and the origin of the second dorsal fin is equidistant from these two points. The length of the base of the soft dorsal fin (35 mm.) is equal to the height of its longest (fifth) ray. Anal base (40) a little longer than its height, which is slightly less than that of the dorsal. The last rays of the soft dorsal and anal fins are almost detached as finlets. The dorsal spines are damaged but the fourth (18 mm.) is the longest. Eye (10 mm.) 6, snout (21) 2·8 in head.



Text-fig. 4.—*Cybium semifasciatum* Macleay. Holotype of *Cybium tigris* De Vis, about one foot overall, drawn to same scale as text-figure 3, from Cape York, Queensland. Qld. Mus. regd. no. I 119.

Gilbert Whitley del.

The colours have all faded, but there is some blackish on the membranes of the first dorsal fin. De Vis described the coloration as follows :—" Five distinct cross-bands on the fore part of the back, several others very indistinct on the hinder part. Anterior portion of the spinous dorsal jet black, pectoral dark grey."

Described and figured from the holotype of *Cybium tigris*, a specimen 273 mm. in standard length or about one foot in total length. Queensland Museum registered number I. 119.

Loc.—Cape York, Queensland ; collected by Kendall Broadbent.

Agrees well with the specimen figured as *Cybium commersoni* by Saville-Kent (Great Barrier Reef, 1893, pp. 291, 311, and 369, pl. xlvi, fig. 1), but does not agree in fin-counts or coloration with the larger " *Scomberomorus commerson* " of Australian authors. I have studied numerous specimens of the latter in the field and although it varies in some characters, I have never seen one quite like De Vis' small fish, which is therefore probably not the young of the better known species.

Field notes on Lindeman Id. specimen.—One specimen (Austr. Mus. regd. no. IA. 6573) from between Lindeman and Maher Islands, Cumberland Group ; August 5th 1935.

Colours when fresh.—Upper parts bluish-green, steely and iridescent. Flanks and belly silvery to white with iridescence. Eye pale dirty yellow, pupil black. Mouth and teeth tinged pinkish. Sixteen dorsal spines; the fin mostly blackish except for almost continuous milky blotches over the sixth to last spines and their membranes. Second dorsal and finlets pearly grey with infuscated margins. Caudal similar, also the pectorals, except that the lower rays are white and the inner pectoral surface is darker than the outer. Ventrals, anal fin and finlets white. A few very indistinct bronze spots between the soft dorsal and anal and their finlets. Apparently a not quite mature male. The maxillary does not reach to behind posterior margin of eye. Locally known as School Mackerel and regarded as young *Cybium commerson*. After death the milky blotches on the first dorsal fin became white, also a dull grey stripe appeared, extending from shoulder to upper part of caudal peduncle. No subvertical bars as in *C. commerson* and only diffuse spots on posterior part of body.

D. xvi/17-10; A. ii/17-10. Head 4 inches. Depth of body, $3\frac{1}{2}$. Total length, 1 ft. 10 in. Pectoral $2\frac{1}{4}$ in. and Eye $\frac{5}{8}$ in. Only four gill-rakers. Teeth on vomer and palatines. Anal originating below anterior dorsal rays.

Genus **CYBIOSARDA** Whitley, 1935.

CYBIOSARDA ELEGANS (Whitley).

(Plate IV, fig. 1 and Text-figure 5.)

Scomberomorus (*Cybiosarda*) *elegans*, Whitley, Rec. Austr. Mus. xix, 4, Sept. 19, 1935, p. 236. Off Goat Island, Moreton Bay, Queensland. Type in Queensland Museum. (No. I. 5143). Total length 15 inches.

This beautiful species was recently described from a Moreton Bay specimen caught, with another, by Mr. G. W. Watson, Under Secretary, Chief Secretary's Department, after whom it may appropriately be called Watson's Mackerel. The original description was as follows :—

" D. xvi/16 + 10 finlets : A. 15 + 8 finlets.

" Head (90 mm.) nearly 4, depth of body (75) 4·7 in length to end of middle caudal rays (355). Eye (10) 9, pectoral fin (44) 2·04 in head ; interocular space (32) subequal to snout (32).

" Upper profile of head oblique, slightly convex. Posterior nostril a lunate slit. Maxillary reaching to below posterior half of eye and overlying an obilque slit behind the rictus.

" General form mackerel-like, with a high spinous dorsal fin and the body plump. A series of long, spaced, compressed teeth along each jaw. A pear-shaped patch of villiform teeth on the vomer and a spindle-shaped patch on each palatine. Broad areas of lingual teeth. Ten long, slender gill-rakers on lower part of first branchial arch.

" Most of the body surface is naked, but there are small scales along the top of the back and on the caudal peduncle. Others occur along the slightly undulating course of the single lateral line, near the source of which they mingle with larger scales to form a corselet. Caudal peduncle with a keel.

" Dorsal fin highest at about the fifth spine ; the interdorsal space is much less than the diameter of the eye.

" Head dark bluish-grey above and yellow on the sides. Body bluish-grey on the back, brownish on the flanks, and white below. Back with many small spots around spinous dorsal and with large scattered dark grey spots elsewhere ; these become oblique on the sides and transformed into three or four horizontal bands. Spinous dorsal black anteriorly and white at the posterior spines. Other fins and finlets yellow, more or less suffused with dusky infuscations."

As a matter of fact, Watson's Mackerel can now be shown to have a much wider range than was supposed, and I now provide a figure, drawn by Miss Joyce K. Allan, which will render its recognition an easy matter. This species was first caught in numbers off Shellharbour, New South Wales, in 1927, and a photograph of one was published in the " Daily Guardian " (Sydney) May 4, 1927 with the following caption :—

" New Game Fish : Mr. John W. Hockey caught hundreds of a new species of Spanish Mackerel (one of which is shown in the photograph) off Shellharbour recently. He used a spinner for their capture. The markings of the fish combine those of the spotted Spanish mackerel and the horse mackerel. The flesh is rich and tasty."

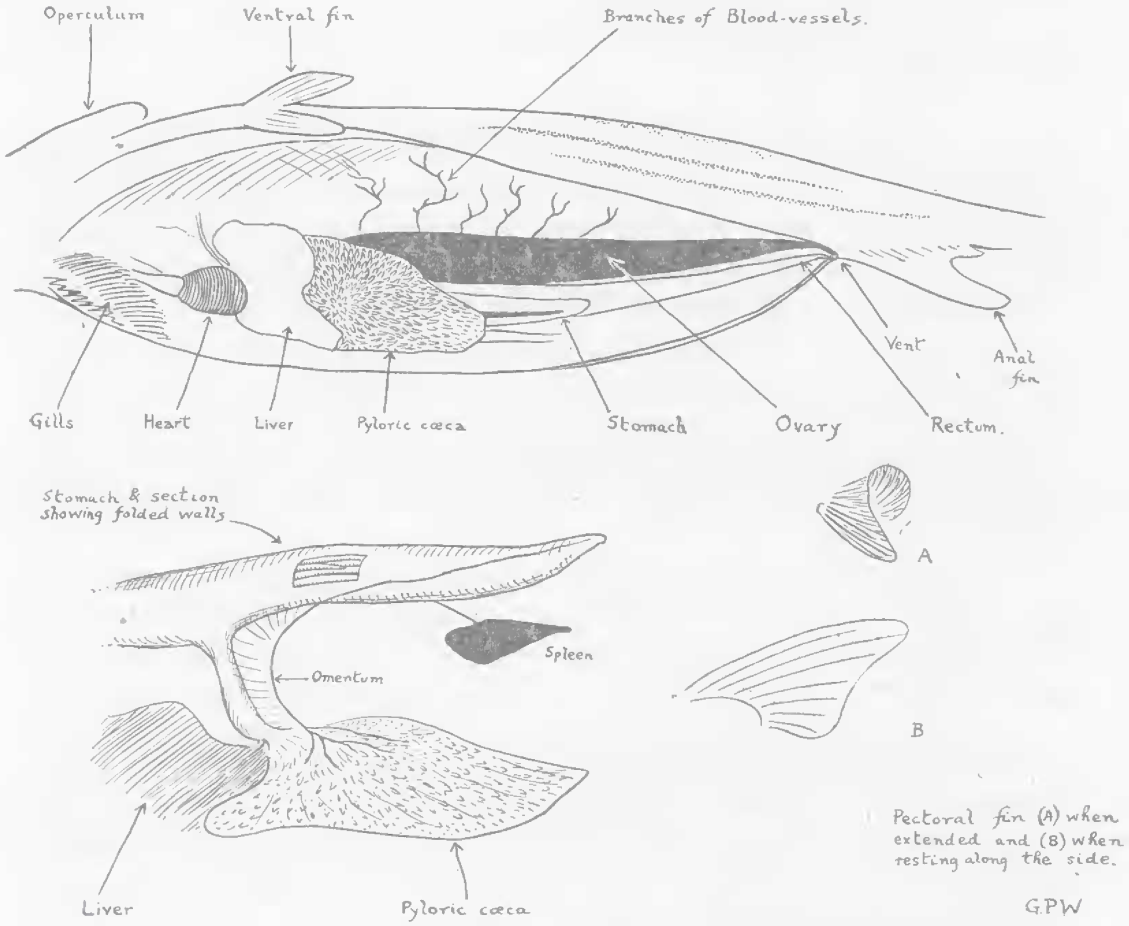
A specimen was secured for the Australian Museum and was sent to the Japanese specialist Dr. Kamakichi Kishinouye who was monographing the Scombroids at that time. He confirmed its novelty and intended to name it in honour of the present writer but his design was cut short when he met his most untimely death at the hands of bandits in China. The specimen, which he himself dissected, was eventually returned and I have it before me now.

It has D. xv/ii, 15 + 9 ; A. iii, 13 + 7 ; vertebrae 45 ; gill-rakers 4 + 9 on first arch, slender and well-developed, not reduced in size and number as in *Cybium*. It is registered No. IA. 3260.

Other specimens had found their way, in March and April 1927, to the Sydney Fish Markets, whence a few were sent to the Australian Museum (Nos. IA. 3470-3473). Then Mr. Watson discovered the species in Queensland, and it was given a new scientific name, his specimens being in the Queensland Museum.

When at Lindeman Island, Cumberland Group, Queensland, in July-September 1935, I secured a few more specimens (Austr. Mus. regd. nos. IA. 6592-6593), one of which is here figured entire. It has Br. 6 ; D. xvi/17 + 9 ; A. 15 + 7,

but does not differ in any marked manner from the more southern ones. The aborigines called these fishes *Gowilla*, or else grouped them with *Cybium commerson* which they called *Woodoona*.



Text-fig. 5.—*Cybiosarda elegans* (Whitley). Dissection of another specimen of about the same size, from Lindeman Island, Queensland; July 23, 1935.
Gilbert Whitley del.

Another specimen caught near Lindeman Island, Queensland, on July 23, 1935, was dissected by me in the field (Text-figure 5) and found to have the following characters :—

Br. 6. D. xvi/17 + 9; A. 15 + 7. Head (82 mm.) nearly 3·8, depth of body (76) 4 in length to end of middle caudal rays (310). Eye (9·5 mm) 8·6, pectoral fin (42) 1·9, interocular space (27) 3, and snout (29·5) nearly 2·8 in head. Agrees generally with the description (then unpublished) of the type of *elegans*. First dorsal spine the longest. Interdorsal space slightly less than diameter of eye. Pseudobranchiae

present. A velum maxillare present in mouth. In this specimen, vomerine teeth are indistinguishable. There is a slight ventral carina. Two reddish gonads, 80 mm. long, and apparently immature roe. Forty-five vertebrae. The anatomical details agree best with those of *Thunnus orientalis* in Kishinouye.

Colours.—Back with mackerel-green iridescence, the spots and stripes greyish. Soft dorsal fin and finlets greyish. Anal lobe yellow, its finlets whitish. Eye dull yellow, the pupil black with a subvertical pearly centre mark. Branchiostegal membrane black, with a white margin.

Finally, Mr. Ludwig Glauert sent me a photograph of a mackerel recently caught at City Beach, Perth, Western Australia, which was immediately recognisable as this same species (W. A. Mus. regd. no. P. 1420).

Thus Watson's Mackerel is evidently a nomadic and gregarious species distributed off the shores of eastern and Western Australia between the latitudes of about 20° and 35° S. It may well prove to be of considerable economic value in the future.

Family POMACENTRIDAE.

Genus **PARMA** Gunther, 1862.

PARMA OLIGOLEPIS Whitley.

Parma oligolepis Whitley, Mem. Qld. Mus. ix, 3, June 29, 1929, p. 230, pl. xxviii, fig. 1. Cape Moreton, Queensland.

Further specimens, besides the types, are in the Queensland Museum from Flat Rock (No. I. 5213) and Mud Island (I. 5249), Moreton Bay, south Queensland.

Family URANOSCOPIDAE.

Genus **ICHTHYSCOPUS** Swainson, 1839.

ICHTHYSCOPUS SANNIO, sp. nov.

Ichthyscopus inermis Waite, Austr. Mus. Mem. iv, 1899, p. 112 (Manning River to Port Kembla, N. S. Wales). *Id.* Borodin, Bull. Vanderbilt Mus. i, 1932, p. 96 (Southport, Queensland).

Not *Uranoscopus inermis* Cuv. & Val., Hist. Nat. Poiss. iii, 1829, p. 310, pl. lxv, from Coromandel and Malabar.

Anema inerme Waite, Mem. Nat. Club N. S. W. ii, 1904, p. 50.

Ichthyscopus lebeck Ogilby, Mem. Qld. Mus. vi, 1918, p. 105 (Tewantin, Q.—size and eggs). *Id.* McCulloch, Austr. Zool. ii, 3, 1922, p. 102 (not fig.); Austr. Zool. Handbook i, 1922, p. 76, and later lists. Not *Uranoscopus Le Beck* Bloch & Schneider, Syst. Ichth. 1801, p. 47, from Tranquebar.

Ichthyscopus lecker Kennedy, N. Qld. Nat. i, 7, 1933, p. 8 (Barron River, Qld.).

The Stargazer recorded from Australia as *Ichthyscopus lebeck* or as its synonym *inermis*, has been identified as such with reservations. As specimens have accumulated, it has become more obvious that our form represents a hitherto unnamed species which differs from figures of the Indian type mainly in coloration, but also in shape and proportions. A Malabar example of the true *I. lebeck*, from Dr. Francis Day's collection, differs from all my Australian ones in having the preocular fringes extending backwards half-way along each side of the interorbital depression,

whereas Australian specimens have the fringes restricted to the anterior part only; they also have the opercles and vertex less granulated than the Indian one, and there are slight variations in fin-rays and teeth.

The Australian Museum has specimens of the new species from numerous localities from Bowen, Queensland, where Mr. E. H. Rainford found it buried in sand at low water, down to Nowra, New South Wales, in which State it is usually trawled in deeper water. From this series, an example just over eleven inches in total length is selected as holotype. It came from Patonga, Broken Bay, New South Wales; Austr. Mus. regd. no. IA. 6309. Ogilby recorded a Moreton Bay specimen over 21 inches long which contained about half a million eggs.

Family BROTULIDAE.

Members of this family are so scarce in Australian waters that it was surprising to find a specimen in the trawl on one occasion in the Cumberland Group. Many genera of this family have been described from other parts of the world, but only a few have hitherto been recorded from Australia. McCulloch's 1929 Check-List[3] gives:— *Brotula ensiformis*, Gunther. *Aphyonus gelatinosus* Gunther. *Dinematichthys iluocoeteoides* Bleeker. *Dinematichthys mizolepis* Gunther. *Dermatopsis macrodon* Ogilby. *Dermatopsis multiradiatus* McCulloch and Waite. *Monothrix polylepis* Ogilby. *Dipulus caecus* Waite. *Typhlonus nasus* Gunther. *Othos cephalotes* Castelnau.

This is a heterogeneous assortment of fishes, not all of them Brotulid, and has to be slightly modified to bring it up to date.

Gill[4] provided the generic name *Nematobrotula* for *Brotula ensiformis*, which thus becomes *Nematobrotula ensiformis*.

I have shown[5] that *Othos cephalotes* is not a Brotulid, but a Serranid fish, *Othos dentex* (Cuv. and Val.), and have published figures of *Dinematichthys mizolepis*[6] and *Dermatopsis macrodon* and *Monothrix polylepis*[7] with a few field notes.

Further, Borodin[8] in 1932 recorded a young *Cataetyx messieri* Gunther from Queensland, and Dr. Borodin assures me (*in lit.* April 14, 1933) that his specimen has the vertical fins confluent with the caudal fin and not separated. However, my Cumberland Group Brotulid is quite different from its Australian allies, being congeneric with a Japanese form, and is accordingly described—

Sub-family SIREMBINAE.

Sirembinae Gill, Proc. Acad. Nat. Sci. Philad. xv., 1863, p. 253.

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[3] McCulloch, Austr. Mus. Mem. v, 1929, p. 355.
[4] Gill, Proc. Acad. Nat. Sci. Philad. xv, 1863, p. 252.
[5] Whitley, Rec. Austr. Mus. xviii, 1932, p. 334.
[6] Whitley, Rec. Austr. Mus. xvi, 1928, p. 303, fig. 2.
[7] Whitley, Rec. Austr. Mus. xix, 1935, p. 239 figs. 8-9.
[8] Borodin, Bull. Vanderbilt. Mus. i, 1932, p. 97.

Genus **SIREMBO** Bleeker, 1858.

Sirembo Bleeker, Act. Soc. Sci. Indo-Néerl. iii, 1858, Ichth. Japan, pp. 3, 22, and 46. Haplotype *Brotula imberbis* Temminck and Schlegel, Fauna Japonica, Pisces 1846, p. 253, pl. cxi, fig. 3, from the Bay of Oomura, Japan.

Brotella, Kaup, Arch. Naturg. (Wiegmann) xxiv, 1, 1858, p. 92. Logotype, *Brotula imberbis* Temminck and Schlegel *loc. cit* (Syn. *Brotella maculata* Kaup), selected by Jordan and Fowler, 1902.

Sirembo Gunther, Cat. Fish. Brit. Mus. iv, 1862, p. 373. *Id.* Bleeker, Verh. Akad. Amsterdam, xviii, 1879, p. 20. *Id.* Jordan and Fowler, Proc. U.S. Nat. Mus. xxv, 1902, p. 756. *Id.* Jordan, Tanaka, & Snyder, Journ. Coll. Sci. Imp. Univ. Tokyo xxxiii, 1913, p. 404.

Kaup's "Uebersicht der Familie Gadidae" in which *Brotella* was proposed and Bleeker's "Vierde bijdrage tot de kennis der ichthyologische Fauna van Japan," wherein *Sirembo* appeared, were published in the same year. Bleeker's paper was signed: "Scripsi Batavia Calendis Ianuarii MDCCCLVII" but was not published until probably after February 1858 and has been given priority over Kaup's paper by subsequent authors.

The Australian Museum has three specimens of *Sirembo imberbis* from Wakanoura, Japan, which confirm my generic identification.

SIREMBO EVERRICULI, sp. nov.

(Plate IV, fig. 2.)

Br. 8. D. circa 84. A.c. 75. P. 21. V. 1. C. 9. Sc. circa 80. L. tr. 8/circa 20.

Head (29 mm.) 5, depth of body (25) 6 in standard length (150). Eye (7) 4·1, interorbital (8) 3·6, preorbital (3) 10, snout (7) 4·1, pectoral (15·5) nearly 2, ventral (20) 1·4, in head.

Head bluntly rounded, the eyes large, with convex interorbital. No barbels. Anterior nostrils in a low tube, posterior ones are large orifices. Most of head covered with thin imbricate scales. A series of mucus pores along edge of preorbital and others on chin. No spine at tip of snout. Operculum with a large spine at its angle and with its inferior margin produced into a few spine-like processes. Mouth large, the truncate end of the maxillary about three-quarters of eye-diameter in measurement.

Bands of fine villiform teeth, the outermost scarcely enlarged, in jaws. Patches of similar teeth on vomer and palatines. No canine teeth. Tongue broadly triangular, adnate to floor of mouth.

Isthmus narrow. Long sparse denticulated gill-rakers on branchiae, eight on lower part of first branchial arch. Gill-openings wide.

Body elongate, tapering, compressed, well invested with oval imbricate cycloid scales, which do not extend over the fins. Many of the scales have the posterior margin notched. The lateral line is even and continuous from the shoulder to between

the posterior dorsal and anal rays and consists of a chain of shallow furrows. Distance from gill-opening to vent rather more than length of head. Anus surrounded by a fimbriated tube, situated a little before the origin of the anal fin.

Dorsal fin originating some distance behind the head; anal fin commencing about two-fifths of the length of the fish from the head. Both dorsal and anal are united to the rather long caudal, which has a rounded margin. About 170 rays in the unpaired fins. Upper pectoral rays longest, but not produced. Ventral fins each consisting of a single filiform ray; they are situated just behind the isthmus, associated with the humeral arch.

General colour in life, silvery, becoming pale olivaceous flushed with pinkish along the back. Ventral surface of head and body white, as are also tip of snout and interior of mouth. Eye silvery, with metallic lustre; pupil blackish. Three longitudinal series of dull golden spots on body, together with some similar smaller spots. Lateral line pinkish-brown. About three golden-brown blotches tend to form an oblique bar passing from snout to operculum through eye.

Dorsal fin dirty whitish, with a kid-white margin and with a row of golden spots, becoming very dark (almost blackish) anteriorly. Anal white, crossed by a dark brown longitudinal band. Caudal white, with one pale golden blotch. Pectorals hyaline. Ventrals white, with a tinge of pink at the base of each ray.

Described and figured from the unique holotype of the species, a specimen 150 mm. in standard length or about 6½ inches overall. Austr. Mus. regd. no. IA. 6564.

Loc.—Off Shaw Island, Cumberland Group, North Queensland. Trawled off "Sea Star Reef" in about 10 fathoms over a mud bottom on a moonlit night, between 9 and 11 p.m., September 13, 1935. Coll. G. P. Whitley. The otter trawl, hauled in by hand by Mr. M. Ward and myself, was unusually heavy to work on this occasion owing to strong currents, nevertheless we obtained 112 specimens of 26 different species of fishes at this time.

Family GOBIIDAE.

AUSTRALAPHIA, gen. nov.

Orthotype, *Australaphia annona*, sp. nov.

Small hyaline perciform fishes with compressed body, cuneiform head, large mouth, and expansive fins. The head criss-crossed by rows of minute mucus-papillae. No scales. Ventral fins approximate. Caudal forked.

Perhaps allied to *Aphia* Risso (Hist. Nat. Europe Merid., iii, 1826, p. 287), but differing in fin-formula and other characters, such as the naked body and forked caudal fin. For observations on the European transparent gobies see Collett (P.Z.S. Lond., 1878, p. 318).

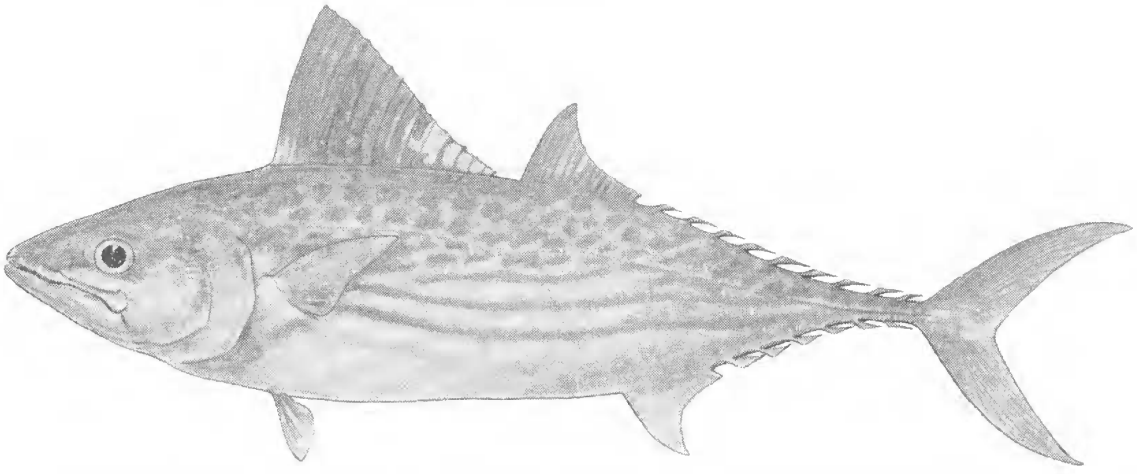


Fig. 1.—*Cybiosarda elegans* (Whitley). A specimen, one foot to end of middle caudal rays, from Lindeman Island, Queensland. Austr. Mus. regd. no. IA. 6593.

Joyce K. Allan del.

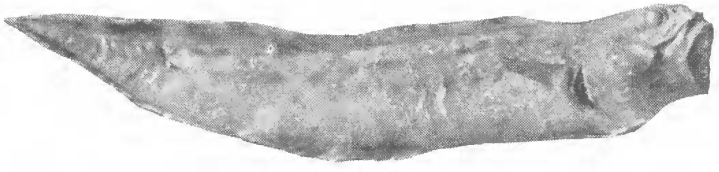


Fig. 2.—*Sirembo everriculi* Whitley. Holotype, 150 mm. in standard length, from off Shaw Island, Queensland. Austr. Mus. regd. no. IA 6564.

G. C. Clutton photo.

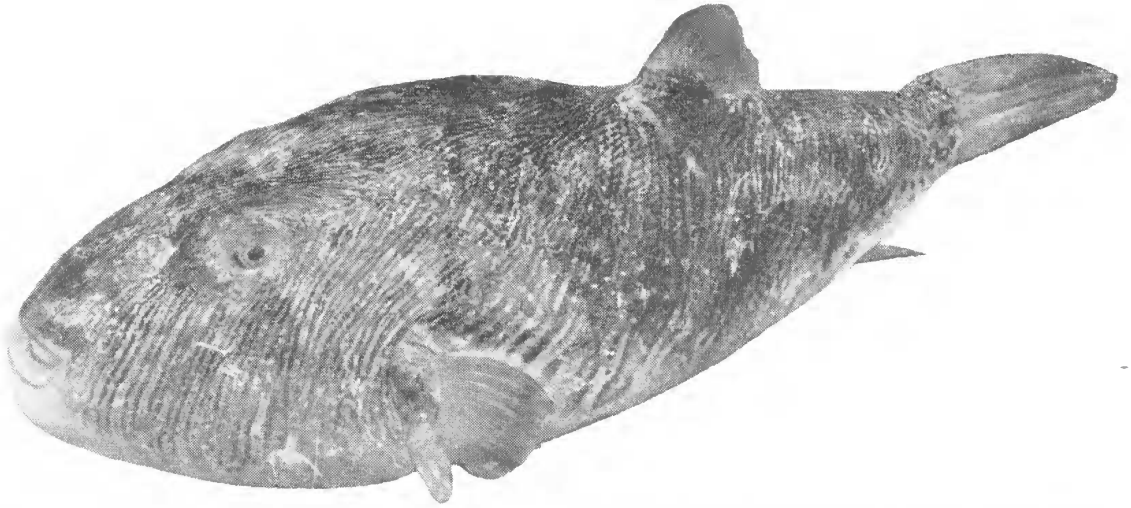


Fig. 3.—*Sphæroides multistriatus* (Richardson). A large specimen from Lindeman Island, Queensland. Austr. Mus. regd. no. IA 6554.

Photo by Professor W. J. Dakin.

Face page 48.

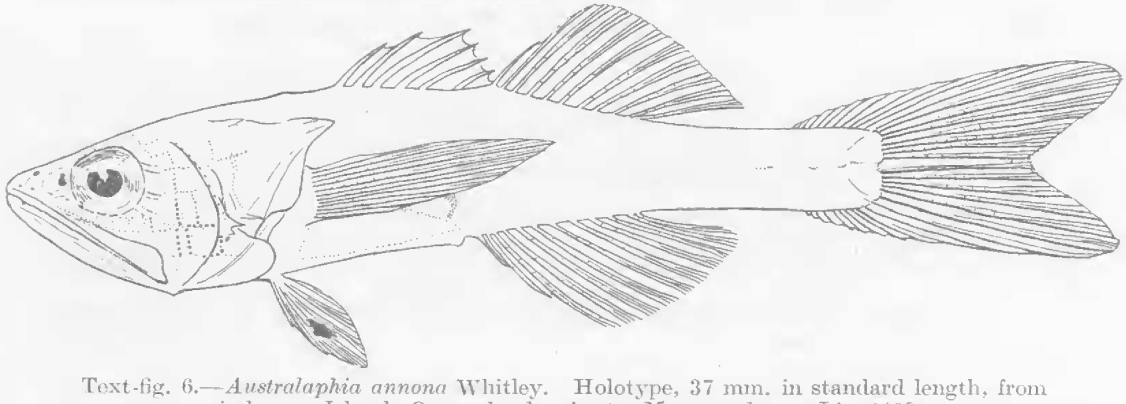
AUSTRALAPHIA ANNONA sp. nov.

(Text-figure 6.)

Br. 6 ? D. vi/11 ; A. ii/10 ; P. 13 ; V. i/5 ; C. 13 main rays.

Head from chin to tip of opercular flap (14 mm.) 2·6, depth (8) 4·6 in standard length (37). Eye (4) 3·5, interorbital (3) 4·7, snout (2·75) about 5, pectoral (10) 1·4, upper caudal lobe (11) 1·2 in head.

Jaws subequal anteriorly, oblique. Maxillary reaching to behind level of eye, its posterior margin excavate, broad, without supplemental bone. Premaxillary broad anteriorly and tapering to a slender bone posteriorly. Premaxillary processes not reaching eye. Acute spaced hooked teeth in a single row in each jaw, largest on sides of mandible. Very fine teeth extend in a single row along the outside of the jaws and along each palatine. Some enlarged teeth on the vomer. Tongue large, acute. Nostrils subcircular. A series of pores around each of the rather large eyes and around the horseshoe-shaped chin. Opercles entire, their bones thin. Integument of head crossed by short vertical and horizontal series of mucus-papillae. A long pointed opercular flap superiorly. Gill-openings wide.



Text-fig. 6.—*Australaphia annona* Whitley. Holotype, 37 mm. in standard length, from Lindeman Island, Queensland. Austr. Mus. regd. no. IA. 6469.

Gilbert Whitley del.

Body compressed, smooth, naked, almost transparent, the silvery viscera and the bones being distinguishable. An anal papilla present. No apparent lateral line.

Fins all hyaline, the spines weak and the rays branched. Two dorsal fins, approximate. First dorsal originating behind level of ventrals, with six spines, the last somewhat removed from the others. Soft dorsal much higher than spinous dorsal. Anal similar to second dorsal. Caudal broad and fan-like, forked. Pectorals long and pointed. Ventrals approximate but apparently not united by membrane, unless this has been torn ; they do not reach the vent when adpressed.

Colour in alcohol, pale horn-yellowish. The fins hyaline. Eye dark greenish blue.

Described from the unique holotype, a specimen 37 mm. in standard length or nearly $1\frac{5}{8}$ inches overall.

Loc.—Lindeman Island, Whitsunday Passage, Queensland ; April 1935. Collected by Mr. Melbourne Ward. Austr. Mus. regd. no. IA. 6469.

Family ANTENNARIIDAE.

Genus **TATHICARPUS** Ogilby, 1907.

TATHICARPUS MUSCOSUS Ogilby.

? Tathicarpus butleri Ogilby, Proc. Roy. Soc. Qld. xx, Jan. 2, 1907, p. 20. Port Curtis, Queensland. Type in Queensland Museum. (No. I. 861.)

Tathicarpus muscosus Ogilby, Proc. Roy. Soc. Qld. xx, Jan. 2, 1907, p. 20. Port Curtis, Queensland. Type in Queensland Museum.

Tathicarpus appeli Ogilby, Mem. Qld. Mus. vii, 1922, p. 302, pl. xix, fig. 2. Wide Bay, Queensland. Type (I. 3183) in Queensland Museum.

Two specimens, 45 to 70 mm. in standard length, were hand-trawled by Mr. Melbourne Ward and myself in 4 to 8 fathoms between Lindeman and Little Lindeman Is., Cumberland Group, Queensland, in August, 1935. On this rich collecting ground, by using 50 fathoms of warp and shooting the trawl six times, we secured 110 specimens of fishes referable to 26 different species in one afternoon. These angler fishes have the pectoral reaching slightly beyond the anal base and quite a number of cutaneous filaments, suggesting the above synonymy.

Family TETRAODONTIDAE.

Genus **SPHAEROIDES** Anon., 1798, sensu lato.

Sphaeroides Anon., Allg. Lit. Zeit., Sept. 24, 1798, p. 676. Latinization of " Les Sphéroïdes " Lacépède, Hist. Nat. Poiss. ii, 1800, p. 22, Vernac. Haplotype, " Le Sphéroïde tuberculé " of Lacépède = *Orbis tuberculatus* Latreille, Nouv. Dict. Hist. Nat. ed. 1, xxiv, March 1804, p. 75.

Pending a revision of the nominal genera of Tetraodontidae, I use *Sphaeroides* for the following species.

SPHAEROIDES MULTISTRIATUS (Richardson).

(Plate IV, Figure 3.)

Anchisomus multistriatus Richardson, Zool. Voy. Herald, Verteb. 1854, p. 160, pl. xxix, figs. 1-3. *Ex* Kaup Ms. " Southern Polynesia."

Tetrodon multistriatus Gunther, Cat. Fish. Brit. Mus. viii, 1870, p. 285.

Spheroides multistriatus Ogilby, Mem. Qld. Mus. iii, 1915, p. 128. *Id.* Ogilby, *ibid.* vi, 1918, p. 103.

Spheroides multistriatus McCulloch, Austr. Mus. Mem. v, 1929, p. 429.

Originally said to have come from Southern Polynesia, this species finds no place in Fowler's " Fishes of Oceania " or its supplements. May the type have come from one of the early 19th century surveys of tropical Australia ?

Ogilby (1915) gave a good description to supplement the original account of the species.

Ogilby (in MS.) stated that he received a fine specimen of this species from Townsville, north Queensland, in September 1913. Again in June 1917, Ogilby himself secured a beautiful example on the outer Caloundra bank, southern Queensland. In 1914, Ogilby wrote to McCulloch saying " According to Regan, the original specimen is lost. He knows nothing of it except the description and the figure."

One large specimen (Austr. Mus. regd. no. IA. 6554) from Lindeman Island, north Queensland, 15th September, 1935, where Professor W. J. Dakin kindly took photographs of the specimen. Its stomach contained fish vertebrae and pulped remains and the ovaries were fairly well developed.

CYPRICHTHYS, gen. nov.

Orthotype, *Tetraodon mappa* Lesson.

This species is quite unlike an *Anosmius*, as Bleeker contended, and evidently requires generic separation from the other Tetraodontidae.

CYPRICHTHYS MAPPA (Lesson).

Tetraodon mappa Lesson, Voy. Coquille. Zool ii (1), 1831, p. 102, pl. v, " Baie de Doréry à la Nouvelle Guinée " = Port Dorey.

Tetraodon calamaroides Bleeker, Nat. Tijdschr. Ned. Ind. i, 1850, p. 96. Batavia.

Crayracion mappa Bleeker, Atl. Ichth. v, 1865, p. 72, pl. ccx, fig. 3 (refs. and synon.). *Id.* Bleeker, Arch. Neerl. Sci. Nat. xiii, 1878, p. 57 (*fide*. Weber and Beaufort).

Tetrodon mappa, Gunther. Cat. Fish. Brit. Mus. viii, 1870, p. 293 (East Indies and Zanzibar). *Id.* Macleay, Proc. Linn. Soc. N. S. Wales vii, 1883, p. 597 (Port Moresby, New Guinea). *Id.* Gunther, Journ. Mus. Godef. vi, 17, 1910, Fische Sudsee ix, p. 464. *Id.* Fowler, Mem. Bern. P. Bishop Mus. x, 1928, p. 469 and xi, 1934, p. 449 (Polynesian locs.).

One large specimen (Austr. Mus. regd. no. IA. 6555) from Lindeman Island. New record for Australia.